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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/035,215	01/04/2002	Susan H. Woods	WWT-02-001US	3488
7590	07/22/2004			
MARY ELISA LANE 16520 MONTECREST LANE DARNESTOWN, MD 20878				
EXAMINER HAAS, WENDY C				
ART UNIT		PAPER NUMBER		
1661				

DATE MAILED: 07/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/035,215

Applicant(s)

WOODS ET AL.

Examiner

Wendy C Haas

Art Unit

1661

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 June 2004.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-55 is/are pending in the application.
4a) Of the above claim(s) 4, 18-40 and 44-55 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-3, 4-17 and 41-43 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 04 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Group 1, claims 1-17 in Paper No. October 31, 2003 is acknowledged. New claims 54 and 55 have not been examined because they are drawn to non-elected subject matter (Group V.) Applicant argues that claims 44-55 are not drawn to a separate invention because they are merely further limitations on the invention of Claim 1 and because Group V was drawn to previously independent claims. The added limitations of claims 44-55 would require a separate search, specifically, of Class 47, subclass 59R. Whether this would most properly place these claims in Group V or Group III or another, new group altogether is unimportant. Either way, the claims do not fall within the subject matter of the group elected. They have not been examined.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 43 are rejected under 35 U.S.C. 103(a) as obvious over Linder et al. in view of Murashige et al. and Caponetti et al. and Marton.

Linder et al. teach induction of embryogenic calli of *Arundo donax* on MS medium supplemented with 1 mg/l IAA and 2 mg/l 2, 4-D. Plantlets were regenerated by placement of embryogenic callus on hormone-free MS medium. Linder et al. do not teach the use of solid media or aseptic technique. Murashige et al. teach that MS medium is generally thought by one of ordinary skill in the art to be solid medium, unless otherwise indicated. See, e.g. page 475, last paragraph. Caponetti et al. teach that sterilization of both explants and media is considered to be state of the art in all tissue culture methods. Marton, on page 5, lines 16-25 teaches the

formation of plantlets on a solid shoot multiplication medium to obtain multiple shoots, noted on page 10 “multi shoot formation occurs”. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the teachings of Linder et al. with solid media while employing aseptic technique. One of ordinary skill in the art would be motivated to combine the teachings of Murashige et al., Caponetti et al. and Marton with the method of Linder et al. to produce uncontaminated cultures and improve experimental results.

Claims 2-3, 5-7, 10, 11, 15-17 and 41-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Linder et al. in view of Murashige et al., Caponetti et al. and Marton as applied to claims 1 and 43 above, and further in view of Woods et al.

The teachings of Linder et al., Murashige et al. Caponetti et al. and Marton are set forth above. Marton also teaches transfer of plantlets to a rooting medium; sucrose in the medium; benzyladenine, kinetin or thidiazuron in the medium; half-strength medium; and a multi-step microshoot tissue culture method of a sterilized immature inflorescence of *Arundo donax* comprising a first step of culture in half or full strength solid MS medium with B5 vitamins, 80 mg/L adenine hemisulfate, 0.12 mg/l picloram, 1 mg/l IBA, 0.5 mg/l 2, 4-D, 0.5 mg/l isopentyladenine, 1 mg/l BA, 0.5 mg/l trans-zeatin, and 3 mg/l TDZ along with 30 g/l sucrose [page 11]. The second step is culture in full or half-strength basal medium 0.02 mg/l TDZ and 30 g/l sucrose to regenerate plantlets [page 12.] The third step is cultivation in soil or in a hormone-free medium for increased plantlet size [page 13.]. Linder et al. in view of Murashige et al. Caponetti et al. and Marton do not teach transferring the mature embryos to a liquid suspension culture to induce more embryos, or to split and subculture embryos.

Woods et al. teach a three-step method of producing bamboo plantlets via somatic embryogenesis and tissue culture.

1. In the first stage, a solid or semi-solid induction medium containing MS salts, NAA, BA and sugar is used. The preferable auxin concentration is between 0.1 and 10 mg/l, typically not exceeding 3 mg/l. [Col. 4, lines 1-40.]
2. In the second stage, a solid or semi-solid medium of MS salts, BA, sugar and 2, 4-D is used for somatic embryo induction. The amount of BA is 0.5 mg/l, though

the disclosure notes this can vary from 0.3 to 3 mg/l. The sucrose concentration is 2% and can vary within the range of 2%-5%. [Col. 4, lines 41-63.]

3. The third step of the method is either to germinate the somatic embryos on full to half-strength basal medium [Col. 5, lines 33-36] or to place the somatic embryos in a liquid suspension culture for further somatic embryo proliferation [Col. 5, lines 37-47.]

It would have been obvious to a person of ordinary skill in the art to use the methods of Woods et al. and Linder et al. in view of Murashige et al., Caponetti et al. and Marton in conjunction with one another to produce *Arundo donax* somatic embryos. A person of ordinary skill in the art would be motivated to do this because Linder et al. show that *A. donax* undergoes somatic embryogenesis in the presence of IAA and 2, 4-D, and the method of Woods et al. is an effective somatic embryogenesis and regeneration protocol for bamboo, a closely related species. It would have been obvious to a person of ordinary skill in the art to expect the method of Woods et al., with the auxin composition modified as suggested by Linder et al., to be an effective somatic embryogenesis and regeneration protocol for *A. donax*. In fact, in Cols. 4-5, lines 64-3, Woods et al. note that the lack of NAA, specifically, as an auxin is critical to somatic embryo induction in their method. Furthermore, the specific concentration of TDZ in claim is well within the range of TDZ concentrations utilized by Marton. As such, the method was *prima facie* obvious at the time the invention was made.

Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Linder et al. in view of Murashige et al., Caponetti et al. Marton and Woods et al. as applied to claims 2-3, 5-7, 10, 11, 15-17 and 41-42 above, and further in view of Stuart et al.

The teachings of Linder et al., Murashige et al., Caponetti et al. Marton and Woods et al. are set forth above. Linder et al., Murashige et al., Caponetti et al. Marton and Woods et al. do not teach specific liquid media components, including asparagine.

Stuart et al. teach the use of asparagine to increase somatic embryo size in liquid tissue culture. Applicant argues that based on Stuart, one would not be motivated to use asparagine in the liquid suspension medium of claim 12. This argument is unpersuasive as claim 12 does not

claim the use of asparagine, only “one or more” of 2, 4-D, BA, IAA, kinetin or TDZ. Stuart teaches the media of claims 12 and 13, specifically, Stuart teaches a basal plant medium plus an auxin, specifically 2, 4-D within the concentration recited in claim 13. Applicant also argues that Stuart teaches that asparagine was “not effective in stimulating embryogenesis” and only “allowed for some increase in embryo size.” Claim 14 does not specify WHY applicant is adding asparagine to the culture medium, and, as asparagine does not hinder embryogenesis and stimulates increased embryo size, the examiner is stumped as to why one of ordinary skill in the art would not be motivated to use Stuarts teachings to increase embryo size, especially as increased size is known in the art to correlate with increased viability.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use any effective specific media components known in the art in the liquid suspension step of the method claimed. One would be motivated to use asparagine, in particular as an obvious additive to increase somatic embryo size, and thus, viability. As such, the method was *prima facie* obvious at the time the invention was made.

Claims 7-9, 11 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Linder et al. in view of Murashige et al., Caponetti et al. Marton and Woods et al. as applied to claims 2-3, 5-7, 10, 11, 15-17 and 41-42 above, and further in view of Sutter.

The teachings of Linder et al. in view of Murashige et al., Caponetti et al. Marton and Woods et al are set forth above. Linder et al. in view of Murashige et al., Caponetti et al. Marton and Woods et al do not teach the use of LS medium.

Sutter teaches that LS medium is a variation of MS medium, well-known in the art, as MS medium with the deletion of Nicotinic acid, Pyroxidine HCl, Glycine and Caesin hydrolysate, and the addition of more Thiamine HCl. LS medium is known as an effective revision of MS medium that is simple to prepare [page 19].

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the teachings of Sutter in conjunction with the methods of Linder et al. and Woods et al. to modify the methods by using LS medium. One would be motivated to do this because LS medium is an effective revision of MS medium that is easier to prepare. As such, the method was *prima facie* obvious at the time the invention was made.

Response to Applicant's Arguments

1. The new 103(a) rejections to claims 1 and 43, and to claims 2, 3, 5,-7, 10, 11, 15-17, 41 and 42, necessitated by applicant's amendment, cite Marton to reject the additional step added by applicant's amendment.
2. Claim 4 was cancelled.
3. The Marton publication IS prior art for purposes of 103(a). Specifically, the Marton publication is a World Patent issuing from a PCT designating the United States. As such, the Marton publication is prior art under 35 U.S.C. 102(e)(2) because it is described in a patent granted on an application that was made designating the United States prior to applicant's invention, specifically on February 5, 2001, and the patent was published in English. 102(e) prior art is available as part of a 103(a) obviousness rejection so long as the prior art and the claimed invention were not, at the time the invention was made, "owned by the same person or subject to an obligation of assignment to the same person." 35 U.S.C. § 103(c). ***Applicant did not claim priority to any provisional application.***
4. Applicant argues that Stuart should not apply as a prior art reference because (1) Stuart was dealing with legumes and (2) Stuart indicated that asparagine was effective only in stimulating embryo size, not embryogenesis. First, in Table 1, Stuart notes the disclosed invention could be applicable to many species, including grasses such as barley, corn, millet and wheat. Second, applicant's claims do not indicate any particular reason for the addition of asparagine. Absent some evidence that asparagine is harmful to embryogenesis or embryo size, it would appear that increased embryo size alone would motivate one of ordinary skill in the art to add asparagine to the culture.
5. The examiner disagrees that there is no motivation for one of ordinary skill in the art to use a known, effective but less expensive culture media to practice the claimed invention.

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Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

No claim is allowed.


Future Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wendy C Haas whose telephone number is (571) 272-0976. The examiner can normally be reached on Monday through Friday 9:00 to 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Wang can be reached on (571) 272-0811. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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